REMARKS/ARGUMENTS

Claims 1-140 are pending. Applicants thank the Examiner for indicating that claims 7-21, 30-44, 53-67, 76-90, 99-113 and 122-136 are allowable. However, pursuant to the discussion herein, Applicants respectfully decline the Examiner's invitation to rewrite these claims in independent form at this time.

The foregoing amendments to the specification are believed to address the Examiner's drawings and specification objections on pages 2 and 3 of the Office Action, and accordingly Applicants respectfully request that the Examiner reconsider and withdraw these objections.

Applicants thank the Examiner for the courtesies extended during the telephone interview conducted September 4, 2007. During that telephone interview, the undersigned and the Examiner discussed the Examiner's objection based on the use of the word "if" in the claims; the Examiner's § 101 rejection; and the Examiner's obviousness rejection. No agreements were reached on any of these issues. In discussing each of these issues below, Applicants will summarize the discussion with the Examiner.

The Examiner objected to claims 5-7, 28-30, 51-53, 74-76, 97-99 and 120-122 for indefiniteness. Applicants respectfully traverse the objection. The use of the word "if" tells the ordinarily skilled artisan that a claim using this term will be infringed <u>if</u> the condition(s) following the "if" is/are met, but will not be infringed if the condition(s) following the "if" is/are not met. This is standard terminology. To Applicants' knowledge, this terminology is not proscribed by any provision in the MPEP, and in any event, would mean to the ordinarily skilled artisan exactly what "when" would mean if substituted into the claims as the Examiner has suggested.

During the interview, the Examiner said that the claims are indefinite because it is not clear whether they will be infringed if the condition(s) set forth following the "if" are not met. The undersigned disagreed with this position, for the reasons set forth above. Applicants would add that the ordinarily skilled artisan, reading the claims that have an "if" condition, would clearly understand that the claims would be infringed only if the "if" condition is met. The claims would not apply, or would be irrelevant, if the condition were not met. For this reason as well, Applicants submit that the objected-to claims are not indefinite.

In view of the foregoing discussion, Applicants respectfully request that the Examiner reconsider and withdraw this objection as well.

The Examiner rejected claims 116-138 under 35 U.S.C. § 101 as purportedly directed to non-statutory subject matter. The Examiner indicates that the term "computer program product" as presented in claims 116-138 is improper based on *In re Warmerdam*, 33 F.3d 1354, 1361-2, 31 U.S.P.Q.2d 1754 (Fed. Cir. 1994). Applicants respectfully disagree at least for the following reasons.

First, the claims are written as dependent, directly or indirectly, from method claim 93, which clearly is statutory. Thus, the strictures in *In re Warmerdam* do not apply.

The language of claims 116-138, referring to a computer program product containing program code for performing the clearly statutory method of claim 93 and its dependencies, is proper under *In re Beauregard*, 53 F.3d 1583, 1584, 35 U.S.P.Q.2d 1383 (Fed. Cir. 1995), which held, *inter alia*, that computer programs embodied in a tangible medium are patentable subject matter. The "computer program product" in claims 116-138 is just such a tangible medium.

During the interview, the Examiner indicated that he consulted with the "101 panel," who indicated that the "computer program product" language is non-statutory. The Examiner also referred the undersigned to an Official Gazette (OG) notice dated November 22, 2005. The Examiner said further that the "computer program product" language used in the claims is language that Examiners are specifically trained to reject under § 101.

The undersigned has reviewed the OG notice in detail, and all relevant portions of the MPEP, to find some indication of the "computer program product" language being objectionable or non-statutory. However, the terms are not mentioned anywhere in the OG notice or in the MPEP.

The Examiner indicated that he would withdraw the rejection if Applicants were to amend the claims to refer to a "computer-readable medium" rather than to a "computer program product". According to the Examiner, the "computer program product" language would read on a computer printout, whereas the "computer-readable medium" language would not. Applicants disagree, for at least the following reasons. First, the distinction the Examiner is drawing is a distinction without a difference. There is neither statutory, caselaw, rule-making, nor any public pronouncement from the PTO that would indicate that these two terms mean different things.

Second, Applicants cannot conceive of a situation in which a patentee would try to read a software claim on a computer printout, and thereby allege infringement. No ordinarily skilled artisan would ever construe a claim in that fashion.

Third, Applicants submit that the term "computer program product" could not be read on a computer printout without somehow running afoul of the printed matter issues that the Federal Circuit discusses in *In re Gulack*, 703 F.2d 1381, 217 USPQ 401 (Fed. Cir. 1983). While

Examiners arguably are entitled to construe claims broadly in order to determine the patentability of claims over prior art, it hardly seems reasonable to stretch the claim so as to read on something that no ordinarily skilled artisan would read it on. Certainly such an approach finds no response in any PTO pronouncement regarding the handling of computer software claims.

Notwithstanding the foregoing, Applicants have amended claim 116 to recite a computer-readable medium. Therefore, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

The Examiner has rejected claims 1-6, 22-29, 45-52, 68-75, 91-98, 114-121 and 137-140 under 35 U.S.C. §103(a) as unpatentable over applicant admitted prior art in view of Boyle (M. R. Boyle & A.D. Fagan, *A Catastrophic Error Mode in Adaptive Predictive DIR Equalization of Dynamic Channels*, 2001 IEEE Workshop on Signal Processing Systems, 26-28 Sept. 2001, at 177). Applicants respectfully traverse this rejection, and request reconsideration and allowance of the claims in view of the following arguments.

Providing a single early decision output to drive a decision-driven control loop, as in the prior art which Applicants discuss in the Background section, addresses the trade-off between accuracy and speed. The longer the memory path used to derive the detector output, the greater the latency. Reducing latency also reduces accuracy. Providing an early decision output with a short memory path reduces latency, but again, reduces accuracy.

In the invention of independent claims 1, 47, and 93, a second early decision output is provided, as well as a first early decision output, and those two outputs are processed to drive a decision-driven control loop.

The Examiner relies on Boyle to teach a second early decision output. Assuming *arguendo* that Boyle does teach such a second early decision output, Boyle does not process that output with a first early decision output to drive the loop, as recited in independent claims 1, 47, and 93, and hence in all of their dependencies. Rather, Boyle uses the cited early decision outputs solely to reduce error, and says nothing about latency. Indeed, the motivation in Boyle for using two outputs as in Boyle Fig. 1 was to avoid gross equaliser misadjustment on dynamic channels. (Boyle, 178)

In contrast, the prior art in the Background section of the present application already deals with the latency/accuracy tradeoff. The alternative to using a single early decision output would have been to use the loop output itself. That would have reduced error, but greatly prolonged latency. That was the problem that the prior art in the Background section already solved. Boyle contributes nothing to solving that problem.

During the interview, the Examiner said that Boyle teaches that using a second early decision output can reduce error. Consequently, since it would be desirable to reduce error in a decision driven control loop, it would have been obvious to use a second early decision output in such a loop, as the Examiner contends is broadly claimed in claims such as claim 1. The undersigned understood the Examiner to be saying that a general alleged teaching of error reduction, such as in Boyle, would have made it obvious to apply that teaching in any context involving an early decision output, such as in Applicants' admitted prior art. During the interview, though the undersigned asked how the ordinarily skilled artisan would have been led to apply Boyle's alleged teachings to modify Applicants' admitted prior art, the Examiner gave no more specific response than to refer once again to error reduction.

Pursuant to the foregoing discussion, Applicants submit that the claims of the present application are patentable.

With respect to claims 5, 28, 52, 74, 97, and 120, neither the Background section of the present application nor Boyle indicates that, as between the first and second early decision outputs, the first early decision output will be used when there is no difference in the early decision signals. Boyle says that the symbol with the lowest metric will be used, but does not indicate whether that will be the first output or the second output. Therefore, Applicants submit that these claims are patentable for this additional reason as well.

With respect to claims 6, 29, 53, 75, 98, and 121, neither the Background section of the present application nor Boyle indicates that, as between the first and second early decision outputs, the second early decision output will be used when there is a difference in the early decision signals. Boyle says that the symbol with the lowest metric will be used, but does not indicate whether that will be the first output or the second output. Therefore, Applicants submit that these claims are patentable for this additional reason as well.

With respect to claims 22, 45, 68, 91, 114, and 137, contrary to the Examiner's assertion, Boyle does not disclose or suggest that a subtraction occurs anywhere in the system, nor are the early decision signals combined in the manner recited in these claims. The early decision signals in Boyle are compared only to determine which signal has the smallest Euclidean metric. Therefore, Applicants submit that these claims are patentable for this additional reason as well.

Applicants submit that this Amendment places the application in condition for allowance, and accordingly Applicants earnestly solicit early favorable consideration of this Amendment.

If, in the opinion of the Examiner, an interview would expedite the prosecution of this application, the Examiner is invited to call the undersigned attorney at the telephone number listed below.

The Office is hereby authorized to charge any fees, or credit any overpayments, to Deposit Account No. **11-0600**.

Respectfully submitted,
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